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IN TWO SECTIONS

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EDITORIAL DEPARTMENT NOTE

During the past several months the shoe industry has exhibited more activity than that shown in many of the less fortunate industries. In this issue of our Bulletin we are presenting a paper in which is discussed "A Physical Check on Shoe Factory Inventory Items." It should be especially interesting to our members in the shoe industry and to those in other industries in which similar inventory problems are encountered.

Mr. Raleigh I. Glynn, the author of this paper, was employed for about six years in the cost accounting department of the Derby Desk Company, Somerville, Massachusetts. From 1913 to 1919 he was connected with Horace C. Hartshorn, C. P. A., Boston, Massachusetts, the firm name now being Hartshorn and Walker. Since February, 1919, he has been a senior accountant in the firm of Herbert F. French Company, Public Accountants and Auditors, Boston, Massachusetts, and is now Assistant Treasurer of that organization.

The second article presented in this issue of our Bulletin is a discussion of "Cost Reports for a Newsprint Company." The main thought expressed in this paper is that in most cases sufficient information is obtainable with the existing accounting department set-up, and that the greatest present need is for more intelligent and intelligible presentation of the available cost data to the executives who should use it.

Mr. Herbert E. Tucker, the author of the second paper, spent three or four years in the offices of two large corporations. For the last twelve years he has been in public accounting work in Boston. He spent one year on the staff of Lybrand, Ross Bros. & Montgomery and the remaining eleven years with Charles F. Rittenhouse & Company. He has been a partner in the latter firm since 1924.

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NATIONAL ASSOCIATION OF COST ACCOUNTANTS

November 1, 1932

PHYSICAL CHECK OF SHOE FACTORY INVENTORY ITEMS

By Raleigh I. Glynn, Assistant Treasurer,
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THE part of this inventory verification program which has been assigned to me is the physical check of the inventory items and control of inventory sheets. In this particular inventory verification, the old season and new season method of inventory taking has been used. Therefore, it is important to outline in detail the procedure and method used.

The shop order in a shoe factory is ordinarily termed a "tag" and the list of shop orders comprising a day's work going into the factory is known as a "day sheet." Orders or tags used in most factories furnish a full description of the shoes to be made and are generally made on a printing press or other machine that will produce many copies, so that separate copies may be furnished to the cutting room, stock room, stitching room, etc. These tags are sorted and arranged before they are entered on the day sheet. The purpose of this is to plan and arrange the orders to make a full day's work for each department, as the shop orders pass through the various departments, and also to be reasonably certain that, when the shop orders reach the various departments, the required materials will be on hand in order that the shoes may pass through the departments without delay.

It is also very important to make sure that a sufficient supply of lasts in the particular styles, sizes and widths called for by the day sheet will be on hand when the shoes making up the day sheet reach the assembly room.

In other words, in the more efficiently managed shoe factory the planning of each day's shop orders is given very careful consideration in order that the shoes may pass through the various departments in the required number of days and that no cases of shoes shall be held up in any department due to lack of material, in sufficient machinery or operatives to perform the work. It may

be readily seen that the lack of proper materials, supplies, lasts, operatives, etc., would cause congestion in certain departments as well as interfere with the keeping of the various department records and the cost department records.

After the shop orders or tags have been so arranged and a day's work planned, they are entered on the day sheet where each shop order or tag is allotted a case number and sufficient information is given to describe the shoes so that they may be readily identified.

In general, shoe factories have stock rooms, a cutting room, stitching room, stock fitting room, assembly rooms, lasting room, making room, finishing room, treeing, dressing and packing room, and supply room.

Stock Rooms

Most factories have a stock room where upper leather is kept under lock and key, and in most cases each lot of leather is given a lot number and provided with a tag showing the total feet of leather purchased as given on the invoice. The feet shown by this tag are reduced by withdrawals from the lot and increased by returns of leather from the cutting room. In most factories the stock room also carries lining materials, which are handled in a similar manner.

Most factories have a stock room where soles, heels, top lifts, counters, etc., are kept.

There is also a stock room, usually called a supply room, in which are kept the sundry materials usually called findings, supplies, machine parts, etc., which are requisitioned by the various departments as required by shop orders.

Cutting Room

As a day's shop orders or tags reach the cutting room, they are sorted to determine the kind and amount of leather that will be required for the shoes and the leather is then requisitioned from the stock room. In factories where more than one grade of shoes are manufactured, it is generally planned to cut two grades of shoes at the same time so as to get the most out of the leather.

After the leather called for by a shop order has been cut, the footage of leather used is determined and the proper record of it is entered upon the cutting room ticket. Any leather not used, together with the scraps, is returned to the stock room.

The linings are cut in the cutting room in a similar manner to that used for the upper leather, except that there is ordinarily no grading required.

When the upper leather and linings, as called for by a shop order or tag, have been completely cut, they are bundled in some manner, marked with the case number, and moved along to the stitching room.

Stitching Room

As the shoes designated by the shop orders or tags reach the stitching room, the uppers and linings are stitched in accordance with the requirements of the particular shoe and then moved along to the assembly room.

Stock Fitting Room

In the stock fitting room the soles are prepared for each shop order or tag by rounding the edges, channelling, etc. In this room the cut soles, insoles, heels, top lifts and counters are selected for each shop order or tag and are then sent to the assembly room.

Assembly Room

In the assembly room the stitched or fitted uppers, as received from the stitching room, are put on racks with the lasts and with the soles, heels, etc., received from the stock fitting room, and, when all required materials are assembled, the racks are moved along to the lasting room.

Lasting Room

In the lasting room the upper leather and linings, as received from the stitching room, are formed and temporarily attached to the last. Here the insole is also attached to the last. Operations in connection with counters, box toes, toe wire, etc., vary in shoe

factories, but none of these operations are of particular importance in connection with an inventory.

When the operations have been completed in the lasting room, the racks are moved along to the making room.

Making Room

We find that the shoe factory under consideration combines the operations of the welt, sole laying and heel rooms, although in many large shoe factories these operations are handled in separate departments.

When the shoes reach the making room, the welting is applied and the insole and upper attached; the outer sole is then attached to the welt; and then the heel is attached. The shoes are then moved along to the finishing room.

Finishing Room

In the finishing room the edges, bottoms and heels are finished and after this the shoes are moved along to the treeing, dressing and packing room.

Treeing, Dressing and Packing Room

Again we find that this shoe factory combines the operations of treeing, dressing and packing, which in many large shoe factories are handled in separate departments. In this room the shoes are dressed or polished, the lacings inserted and the shoes packed and moved along either to the shipping room or to the stock department.

In the foregoing description of the departments in a shoe factory and the operations performed, I have not given complete detail, but have simply furnished a general outline in order that you may more clearly understand the inventory method used and also have in mind some of the materials and supplies that should be found in the various departments at the inventory date.

In connection with this inventory verification we find that fifteen days are required to put shoes through the factory and that the time is divided as follows: three days for cutting, four days for stitching, two days for lasting, three days for making, one day for finishing, and two days for treeing, dressing and packing.

Therefore, for the purposes of an October 31 balance sheet on this manufacturing basis of fifteen days, the last day sheet to the cutting room would be issued on October 15 in order that the finished shoes called for by this day sheet may be shipped and billed or be in the stock department at the close of business on the balance sheet date.

PROGRESS AND INVENTORY CHART

	Days in Room	*Date In*	*Date Out*	*Inventory Date*
Upper Leather Stock Room.....				19
Sole Leather Stock Room.....				23
Supply Room				Various
Cutting Room	3	15	17	19
Stitching Room	4	19	22	23
Stock Fitting Room			22	23
Assembly Room			22	23
Lasting Room	2	23	24	26
Making Room	3	26	28	29
Finishing Room	1	29	29	30
Treeing, Dressing and Packing Room	2	30	31	*31

*After close of business.

In practically all shoe factories where inventories are taken on the old season and new season basis, a break of at least one day is made in the day sheets in order to separate the two runs and allow sufficient time to take the inventories in the various departments: for example, in this particular case there was no day sheet issued on October 16. The purpose of this break of one day is definitely to separate old season shoes from new season shoes, but there are instances when one will find materials and supplies for new season shoes in the department at the time of taking the inventory. Any such materials should be noted and will be a part of the so-called new season's purchases, which will be explained later on.

Assuming that the last day sheet of the old season is issued on October 15, we should expect to find the various rooms ready for inventory verification as follows:

Upper leather stock room	October 19
Sole leather stock room	October 23
Cutting room	October 19
Stitching room	October 23
Stock fitting room	October 23
Assembly room	October 23
Lasting room	October 26
Making room	October 29
Finishing room	October 30
Treeing, dressing and Packing room	October 31 at the close of business

On this basis we should take the upper leather in the stock room, as well as lining stocks, on October 19.

The supply room inventory, to be taken correctly, should be divided and taken on various dates between October 19 and the close of business October 31, for the reason that findings and supplies used by the stitching room cannot be taken until October 23, those used by the lasting room until October 26, and so on up to the treeing, dressing and packing room, on which the inventory should not be taken until the close of business October 31.

In some instances a supply room inventory is taken when old season shoes leave the stitching room on the theory that, if taken at this stage of process, the inventory should be approximately correct, as shoes which have passed through the stitching room may be considered to be half way through from the standpoint of findings and supplies.

I have endeavored to give you a general picture of what one needs to know in connection with the verification of a shoe factory inventory taken on an old season—new season basis and will now take up the details in connection with the actual verification of quantities.

In this inventory verification we were furnished with duplicate inventory sheets which showed quantity and description of each inventory item.

Our first verification of quantities was in connection with upper leather in the stock room on October 19. In accordance with our instructions to the company prior to the actual taking of the inventory, the items on the inventory sheets were arranged so that they followed the stock around the room. This arrangement materially simplified our verification of the inventory. As a result we were able to start in one corner of the room and by means of the lot number shown on the tag accompanying each parcel of leather were able to check the lot to the inventory sheet. When one is familiar with the verification of leather inventories, one can estimate fairly closely the number of feet in each lot of leather and thereby satisfy one's self that the quantity is approximately correct. However, we did not rely wholly on our ability to estimate quantities, but made sufficient tests of the actual quantities to satisfy ourselves that the company's figures were substantially correct. You, of course, must realize that it would not be practical for the accountant actually to verify the footage of all leather in a shoe factory inventory, and it does not seem necessary when one finds that in all the tests made the company's figures are accurate.

In checking the quantities on the upper leather inventory we also watched for any leather on hand that was not being used either on account of color or quality. In order to do this it was necessary for us to familiarize ourselves with the leathers required for shoes being manufactured, and it was also essential that we watched to see that there was not an oversupply of certain kinds and grades of leathers. Where any of these conditions were found, a proper notation was made on the inventory sheet to be taken up later in connection with the pricing of the item.

Leather found in shippers' original packages were generally accepted without verification, but some tests were made of these items by having the case or bundle opened and the footage or dozens totalled. This verification of original bundles and cases is particularly necessary, as there have been instances where the stock man has made up such bundles and cases and, when opened, they were found to contain principally scraps, inventoried as high grade leather.

The checking of quantities on lining stocks, soles and heels was made on substantially the same principles as described in connection with the upper leather.

Verification of quantities on other materials and supplies was made at various times, depending on the date when the old season shoes had passed through the department, as previously indicated. In this connection it was necessary to take the materials and supplies in the department and in the stock room at the same time.

In checking the supplies inventory it is not generally considered necessary to verify all of the quantities for the reason that the supplies inventory comprises a small percentage of the total inventory. We saw that a certain amount of each item was on hand, as indicated by the inventory sheets, and made detailed tests of some of the larger items.

INVENTORY ITEMS

- Upper Leather
- Linings and Trimming Stock
  - Leather Linings
  - Cloth Linings
  - Inter Linings
  - Tongue Linings
  - Backing Cloth
- Sole Leather, etc.
  - Outer Sole
  - In Soles
  - Middle Soles
  - Counters
  - Taps
  - Welting
  - Heels
  - Top Lifts
  - Box Toes
  - Rubber Soles
  - Rubber Heels
  - In Sole Cloth
  - In Sole Felt
- Special Findings
  - Eyelets
  - Hooks
  - Laces
  - Top Facing
  - Buttons
  - Cover Cloth
  - Piping
  - In Sole Labels
  - Tissue Paper
  - Buckles
- Cases, Cartons, etc.
  - Wood Boxes
  - Fibre Cases
  - Cartons
  - Carton Labels
  - Wrapping Paper
- General Findings
  - Dyes—Stains—Inks
  - Polish—Waterproofing
  - Cement—Paste—Gum—Glue

Tacks—Nails—Brads
Silk, Linen and Cotton Thread
Shellac
Tallow—Wax
Oil
Vamp Stays
Inside Seam Stays
Needles—Awls
Tape
Sheet Cork
Chalk
Soap
Sandpaper
Heel Drivers
Wire
Crayons
Manufacturing Expense
Paper
Sponges
Matches
Emery Wheels
Sharpening Stones
Felt Pads
Felt Washers
Wiping Rags
Cheese Cloth
Waste
Baling Wire
Other Supplies
Power, Light and Heat
Repairs
Sanitary Supplies
Knives
Small Tools
Advertising Material
Parcel Post
Stationery and Printing
Waste and Scrap

In checking the quantities in this inventory we found items had been omitted and we had these omissions corrected on the original sheet as well as on our own copy. We also found some minor errors in quantities, and for the moral effect insisted on their being corrected.

Up to this point I have endeavored to give a general idea of the necessary knowledge and the detailed work in connection with the verification of quantities in a shoe factory inventory, so far as it relates to old season's materials and supplies. Before taking up the question of inventory items relating to new season's purchases and payroll, I shall give you an idea of the advantage of taking a shoe factory inventory on an old season—new season basis over taking the inventory at the close of business on the balance sheet date and thus including a process inventory.

It can be seen that, in taking a shoe factory inventory on an old season—new season basis no estimates are required in pricing the inventory except for finished shoes, since we have an inventory of leather, materials and supplies in their original condition as

purchased with no element of process added to them. In an inventory taken at the close of business on the balance sheet date, we, of course, should have a process inventory, comprising materials and supplies in the cutting, stitching, stock fitting, assembly, lasting, making, and treeing, dressing and packing rooms, to which would be added labor and overhead at the various stages of process. The pricing of this labor and overhead would necessarily to some degree have to be estimated.

In addition to the elimination of price estimate required on a process inventory, there are also other important advantages in taking an inventory on an old season—new season basis. It is much simpler to take, much easier for the accountant to verify and requires much less time on the part of the factory employees as well as on the part of the accountant. In the verification of an old season—new season inventory it is customary for all purchases to be considered as new season's merchandise if they arrive at the factory after the closing date for their respective departments. Therefore, they are entered on the receiving book as new season's purchases and charged as such in the books of account.

The charges to the new season's purchases account should include all invoices for materials and supplies dated prior to October 31 and not included in the inventory. The verification of these new season's purchases is made by listing the invoices in regular inventory manner, showing the quantities and description, and then checking the items against the actual merchandise.

The new season's payroll is charged in the books of account to an account so labeled and includes all labor on new season's merchandise, which starts with the cutting room in this case on October 20. The ledger account at October 31 was found to include both wages paid and wages accrued, and there was an accrued payroll account set up in the books as a liability, which included accrued payroll on both the old and new season's merchandise.

The verification of the new season's payroll asset account was made by checking the payroll to determine that all new season's payroll charged to the account was on shoes that had been put into the cutting room subsequently to October 19. This was

easily determined by the case numbers shown by the first day sheet of the new season.

Provision must also be made for overhead on new season's business.

Stock Department Shoes

The purpose of the stock department in most shoe factories is to keep on hand in this department a reasonable stock of each style of shoe in properly balanced sizes to meet the current demand and to permit immediate shipment of orders received. It can be readily realized that it is somewhat difficult to forecast what the demands of the trade will be and, therefore, it very often happens that an overstock of some styles is manufactured and, after remaining in the stock room a certain length of time, becomes obsolete.

In most shoe factories the stock room is divided into bins. It is generally the intention to store only one style of shoe in a bin and to arrange the shoes in the bins by sizes and widths. This arrangement not only simplifies the work at inventory time, but also expedites the putting up of orders and eliminates to a large extent the chance of error in shipping the wrong style, size or width.

In this shoe factory there was a perpetual record kept of shoes in the stock department by styles, sizes and widths. At the inventory date this perpetual record was checked to the actual shoes in the Stock Department and adjusted for differences. The inventory sheets were prepared from this perpetual record after it had been checked and adjusted.

The verification of the inventory of shoes in the stock department was made by checking the style numbers shown on the cartons of shoes in the department to the inventory sheets and by making tests of sizes and widths and tests to determine that all cartons contained shoes. We were watchful to see any styles on hand that appeared to be obsolete or not selling. In this connection one can very often learn much from the employees in the department. When this information is received in the process of verification of the quantities, a proper notation is made upon

the inventory sheets to be used later in connection with the pricing of the inventory.

In most shoe factories one will find in the stock department cases of shoes that have been returned or held for shipment. If such cases are found, it is most important to satisfy one's self that they actually contain shoes as called for by the inventory and also to obtain a complete story regarding the condition and salability of the shoes in order to price them properly. It may be found that the shoes returned are either damaged or obsolete, and that the shoes held for shipment are not regular stock shoes and, if not taken by the customer, might have to be sold at a reduced price.

A shoe factory inventory generally includes cartons and cases of shoes located in the packing and shipping rooms. If so, it is necessary to satisfy one's self that the shoes are proper inventory items and this can reasonably be determined from the department records and from the employees. In checking the inventory of the packing and shipping rooms it is important to account for all shoes on hand and determine that any shoes found to be included in accounts receivable properly belong there. Wherever cases of shoes are found on hand, it is important to satisfy one's self that these shoes have not been included in both accounts receivable and inventory.

Store Inventories

We now come to the verification of the inventories at the stores and you will remember that in this particular case there were twenty-five stores operated by a subsidiary corporation and that the shoes shipped to the stores were billed by the manufacturing company to the stores at the same price and in the same manner as the shoes billed to other customers. You will also remember that the stores sold shoes other than those manufactured by the parent company. As would be the case with the average accountant, it was not possible to verify the inventories of twenty-five stores located in various cities and states at the balance sheet date, owing to the number of men that would be required and the exorbitant traveling expense that it would necessitate. There-

fore, it was decided to verify a part of these inventories at dates preceding the balance sheet date, and the remainder at subsequent dates.

Arrangement was made through the store managers to have the stores take their inventoreis on the dates decided upon and to have the inventories prepared in duplicate. In planning our schedule for the verification of these inventories, it was necessary to estimate carefully the time required for the verification at each store and to allow sufficient time for possible delays at some stores, as well as delays in transportation.

The verification of the inventories at the various stores consisted of checking each style as shown by the inventory sheets to the cartons in the shelves and, in connection with this checking, it was most important to satisfy one's self by a substantial test that the cartons contained shoes and that the shoes were of the same style as called for by the carton label. There have been instances where the store managers have prepared incorrect inventories, either purposely or through error, by inventorying empty cartons and by inventorying low grade shoes as high grade styles.

In checking an inventory at a shoe store it is particularly important to obtain as complete information as possible in connection with the general condition of the stock in order to determine what portion of the inventory consists of obsolete styles, irregulars, worn shoes, etc. It is also important to ascertain the balanced condition of styles by sizes. These conditions are necessary information to be obtained in connection with the pricing of the inventory.

On this plan of stores inventory verification it, of course, is necessary to adjust by purchases and sales the inventories verified by us to those taken at the balance sheet date. This adjustment was carefully arranged for with each store manager, who furnished us with a list of purchases and sales made between the inventory date and the balance sheet date, showing pairs, styles and costs. These adjustments as furnished by the store managers were verified to our satisfaction from the company's records.

The shoes in transit from the manufacturing company to the stores were verified by reconciling the difference between the inter-company accounts.

The stores inventory sheets made at the balance sheet date were prepared in two sections: the first section including only shoes manufactured by the parent company and the second section including all other merchandise. This was for the purpose of enabling us to obtain separate totals for each.

Commitments or Contracts

In connection with the verification of an inventory one should obtain a detailed list of all outstanding commitments and contracts from the purchasing agent. These should be taken up with a responsible official of the company to ascertain that all commitments are for current needs and the prices should be checked to see that they are not in excess of market on the balance sheet date. In cases where the commitments are found to be at prices in excess of market, a reserve should be set up on the books of account for the difference between the commitment price and the market value.

Extensions, Footings, Etc.

When the inventories prepared by the company have been completed they should be compared with the carbon copies, which have been in the possession of the accountant, in order to see that they are in agreement.

In instances where the company has made changes on its copy of the inventory, it is most important to make sure that the changes made are proper ones.

In the larger accountants' offices the extensions and footings are checked by trained machine operators. Any errors or differences are listed by the operator. This list is taken up with the proper person and the company's inventory adjusted. The most common error found in verifying inventory extensions is the misplaced decimal point. Other errors for which the trained operator is ever watchful are cases where the quantity is shown in units and the price is by the dozen, gross, hundredweight, ton, etc.

When the inventory is completed and ready to be entered in the books of account, it should be carefully scrutinized by the accountant to see that the summary has been properly made and more especially to satisfy himself that everything necessary has

been done to make definitely sure that he is now ready to certify to the correctness of the inventory.

Conclusion

I have endeavored to give you a general picture of shoe factory operations as they relate to inventory verification and to give you some idea of the procedure and detailed operations in connection therewith, as well as the work required in connection with the verification of the inventories of shoe stores. However, I realize that I have only covered the subject in connection with a shoe factory having reliable records in its office and throughout its departments, and that in this particular inventory we found it the intention of the company to take an honest inventory. If I were to take up the matter of inventory verification in a shoe factory that did not have dependable records, or that took its inventory on a process basis, the subject would have been much more difficult and perhaps impossible to handle, as the ramifications of such an inventory are innumerable.

In the verification of any inventory it is generally acknowledged that there cannot be any set rule laid down, but that every inventory verification differs in many respects. Therefore, any accountant, accepting an assignment for the verification of an inventory, must realize that it calls for a large amount of judgment, tact, ingenuity, experience and, generally, hard work.

COST REPORTS FOR A NEWSPRINT COMPANY

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COST accounting in the paper industry has been gradually evolved to a comparatively high state of efficiency. This evolution has of course been the result of the work of many minds over many years. The pioneer efforts of twenty-five or more years ago have been succeeded by the work of experts, and through the cooperation of trade associations the subject of accounting for paper costs has been studied minutely and the results of these studies made available through various publications and bulletins of high merit.

It is not the purpose of the present article to add to this wealth of literature on the methods and practices of paper mill cost accounting. The aim instead is to vary the emphasis from the points that in the past have been the most stressed. In other words, it is my opinion that the need of today is not for more data or more exact refinements of figures, nor even for more economical ways of assembling cost data, although the necessity for cost accounting at the minimum cost was never greater than at present.

The problem and the need of today is to make better use of what we already have. No special criticism is made of the paper industry that does not equally well apply to many other industries, when I state that too much emphasis has been placed on the mechanics of ascertaining theoretically correct distributions of expenses and exact unit costs, and not enough on the problem of making the best use of the knowledge gained from all the mechanical figuring that is done in nearly every factory office.

I do not wish to minimize the importance of working constantly toward a further improvement of methods, toward a greater degree of uniformity throughout the industry as to nomenclature and functions of accounts, as to proper bases for cost standards, correct expense distributions, etc., but I do want to emphasize that the major problem for most companies in the industry is to know whether or not they can survive, not whether or not

their cost figures have been computed by the most approved methods.

Hence the statement that the greatest present need is for intelligent and intelligible presentation of cost figures. It is imperative for a company's continued existence that its executives should understand the essentials of cost data, and particularly the direct effect of cost changes on the financial statements of the company.

This article is written with specific application to a newsprint paper mill and the forms and terms have special reference to that industry. The principles and criticism contained herein are, however, quite general in their applicability. In the ordinary newsprint paper mill there is a single product being continuously produced so that the problem of assembling cost data is less intricate than in many industries. Standard costs may be used, but even where not used, normal or expected costs for the different stages and elements of cost have in nearly every mill been carefully predetermined.

Description of Product:

As a preliminary to a discussion of recommended cost reports, it will be advisable to submit a brief descriptive outline of the product and manufacturing processes.

The basic raw material used in the production of newsprint paper is soft wood, chiefly spruce, fir or hemlock. The wood is converted into two distinct forms of pulp, known as sulphite and groundwood, which are combined in the finished product.

The preparation of sulphite pulp begins with the cutting of the raw wood into small strips by means of rotating knives. The chips are fed into tall, steel, brick-lined tanks where, in combination with bisulphite acid, they are "cooked" under steam pressure. This cooking process breaks the chips down into a wet mass of long, separated wood fibres, almost pure cellulose, which, after being washed and screened, are ready for the paper machines.

Groundwood pulp is prepared by a purely mechanical process. The sticks of wood are forced against a rapidly revolving grindstone which reduces them to a mass containing much shorter fibres

than are present in sulphite pulp, and containing the original ingredients of the wood, other carbohydrates as well as cellulose.

The two kinds of pulp are mixed, usually automatically, in proportions approximating 25 per cent for sulphite and 75 per cent for groundwood, together with any necessary fillers or colors.

The short fibres of the groundwood form the body of the newsprint, while the longer fibres supplied by the sulphite pulp give the paper its tenacity. This essentially low-cost paper naturally contains the minimum amount of the more expensively produced sulphite pulp that is consistent with the desired standards of durability. This mixture is then ready for the paper machine wire. At this point, it contains about 99½ per cent water.

The mixture is spread out in a thin layer over the closely meshed wire. Much of the moisture is removed by gravity and suction while the embryo sheet of paper runs off the wire onto a long strip of high grade felt. The felt carries the paper first between heavy rollers which compress it and remove more moisture, then through the dryer section. In passing through the dryer section, the paper is carried over a series of large revolving steam-heated cylinders. The moisture content is still very large when the paper enters this section of the paper machine, but is greatly reduced therein. From the dryer cylinders the sheet is conveyed through another series of heavy steel calendar rolls that further compress it and smooth its surface. The finished newsprint is then carried off the machine and mechanically rolled up on cores. The paper comes off the machine in a continuous sheet.

The finished newsprint contains a certain percentage of moisture usually about 8 per cent. The control of the final moisture content is important from the point of view of standardization. At present some mills use an ingenious radio control device for this purpose. By means of this device the moisture content is measured as the finished paper comes off the machine and any variation at this point automatically effects an increase or decrease in the amount of steam that is released into the drying cylinders farther back on the machine.

Manufacturing Costs:

As before intimated, the subject of cost accounting procedure for paper mills has been thoroughly covered by various other

writers and in various publications, notably those of the Newsprint Service Bureau, and of the American Paper and Pulp Association, as well as in sundry articles in trade journals. No detailed exposition of procedure can be made in this article. For those interested who are unacquainted with the subject, the best reference is to the publications of the associations above mentioned.

The accounts and characteristics which are extraordinary and peculiar to the industry deserve some mention, however.

In comparison with most other industries a paper mill requires a very heavy capital investment. This is due to the nature of the manufacturing processes which require expensive machinery and necessitate large expenditures for power. Not only must the initial expenditures be very large but the plant for which they are expended is not readily convertible to any other use, as would be the case in some of the light manufacturing businesses. Accurate costs are therefore an essential part of the whole financial problem of the industry and not merely a part of the merchandising problem. For instance, abandonment or shut-down of an inexpensive plant may not be vitally important, but abandonment of a paper mill probably entails an enormous loss.

Closely related to the capital investment problem is that of raw material supply. Most newsprint mills own some timberlands; some mills own very extensive tracts of land. Consequently, we have a problem in depletion of natural resources. Proper depletion charges should be based on accurate records of timber stands, original costs reduced to a unit base, and annual records of cuttings. Where land has been bought in separate tracts, or where subdivision of very large tracts by survey is practicable, it will usually be advantageous to make separate accountings for each lot.

The various expenses connected with maintaining timberlands, such as taxes, fire-protection, surveys and other incidental charges are not directly chargeable to paper costs. Most companies owning timberlands operate them through distinctly separate departments, sometimes through subsidiary operating companies which bill the cut pulpwood to the paper mill sometimes at cost and sometimes at an established price, allowing a profit for timber operations. If the paper mill is so situated that a supply of pulpwood could

be purchased in open market, I believe the timberlands operating unit should charge wood cut from the company's own lands at this market price.

Raw material supply may determine the location of a mill, but perhaps a more important factor in the choice of location is the necessity in this industry for a very large supply of water of suitable purity for processing the pulp and paper. The water used has been estimated at from 50,000 to 200,000 gallons per ton of paper produced. The very location of a mill, based as it is in large part on these factors, may make the property of little or no use for any other form of industry.

Water supply may also be important as a source of power, and the necessity for using a great amount of power, either electricity or steam or both, is another factor in the large capital investment required in this industry. Variances between mill locations and available sources of power supply make general comments difficult, and must always be taken into consideration in any comparisons of costs between mills. Some mills own their own power supplies, perhaps use some direct water power, or generate their own electricity by water; others must depend entirely on fuel for generation of electricity and production of steam; others again operate almost entirely on power purchased from other companies; while a fourth classification includes those mills that produce more power than they themselves can use and are so situated that they can market the excess and use the income so derived to reduce their own power costs. The point here stressed is not only that power costs may vary greatly due to varying sources of power, but that power costs are a relatively large item of cost and must therefore be watched closely and controlled wisely.

Cost Reports:

The purpose of all cost accounting should be to coordinate all information relative to production and product sold in order to show how much the profit has been for a given period and what the result has been on the company's financial position. This ultimate aim should never be lost sight of by the cost accountant. The cost reports are, or should be, prepared for the company's principal executive officer. He is interested in profits realized

per share of stock, in the maintenance of a proper amount and ratio of working capital, in improvements in costs or failure to improve them, and why. Matters such as these are his interests, and not the methods of entering original cost data into the basic records. One reason for the impatience of many business executives with their cost accountants is often the fault of the accountants themselves, in that they frequently are in the habit of cluttering up their reports with too many inconsequential figures, and not presenting them in such form that any item on a principal statement that the executive wishes to question may easily be followed back to cost reports or other supporting schedules, with an answer readily found, probably both in unit figures and in dollars.

Considering again the specific industry—a newsprint paper mill—what reports should be prepared? As above outlined, the plant is made up of departments whose operations or functions are distinct, or, at least, easily separable. The operating costs of each department should be the subject of a separate report. Thus we would probably have reports of operations of at least all of the following:

Shipping department
Paper mill
Sulphite pulp mill
Groundwood pulp mill
Wood room
Steam plant
Electric department
Water power department
Machine shop and other general service departments.

Separate reports drawn up in comparative form for this month and year to date with corresponding figures for a year ago are most useful. Reports should be set up so as not to appear crowded with figures. The major items of cost should be listed separately and totaled, and their distribution to product or to other departments clearly stated. For example the steam department report might be drawn up in the following form (account names are illustrative only and actual reports might well contain a longer list of indirect expense accounts):

	THIS YEAR		*LAST YEAR*	
	Current Month	*Year to date*	*Current Month*	*Year to date*
Operating labor.....	$	$	$	$ .....
Repair labor	.....	.....	.....	.....
Belting	.....	.....	.....	.....
Lubricants	.....	.....	.....	.....
Repair materials ...	.....	.....	.....	.....
Supplies	.....	.....	.....	.....
Fuel	.....	.....	.....	.....
Fuel handling	.....	.....	.....	.....
Total	$	$	$	$ .....
Distributed to:				
Sulphite	$	$	$	$ .....
Groundwood	.....	.....	.....	.....
News Paper	.....	.....	.....	.....
Wrappers	.....	.....	.....	.....
Total	$	$	$	$ .....

Remarks:

The paper department report would require the following:

	THIS YEAR		*LAST YEAR*	
	Current Month	*Year to date*	*Current Month*	*Year to date*
Manufacturing labor	$	$	$	$ .....
Repair labor	.....	.....	.....	.....
Belting	.....	.....	.....	.....
Lubricants	.....	.....	.....	.....
Repair materials ...	.....	.....	.....	.....
Supplies	.....	.....	.....	.....
Felts	.....	.....	.....	.....
Wires	.....	.....	.....	.....
Dryers	.....	.....	.....	.....
Total	$	$	$	$ .....
Distributed to:				
News paper	$	$	$	$ .....
Wrappers	.....	.....	.....	.....
Total	$	$	$	$ .....

Remarks:

Attention is called specifically to the last item, "Remarks." I find it is often true that brief but important comments on the cost figures will receive more attention than the figures themselves. Such comments might be notations of extraordinary labor costs due to this or that reason, or of expenditures for an unusual repair item, or of use of a new type of pulpstone or wire, etc. Moreover, certain ratios are always significant and may be used as means of control of costs, and the same is true of other explanations than ratios, which never get into a mere tabulation of dollars and cents costs. I refer to such items as unit price of pulpwood; amount of wood used per ton of paper; percentage of sulphite content in newsprint paper; tons of coal used; sulphur used per ton of sulphite pulp; number of grinders run and average production per grinder; per ton costs of felts and wires used on the paper machines; statistics relating to fuel consumption; average daily production of paper; percentage of actual to standard production; and similar items of information.

Supplementing the reports of operations by departments should be a set of production reports. In the newsprint mill there would be one for paper production, one for sulphite production, one for groundwood production, and if the mill makes its own supply of wrappers, one for wrapper production. On each of these will be entered the direct materials used, which for paper would consist of the groundwood and sulphite pulp, color, wrappers, etc., and for sulphite and groundwood production, the raw wood, sulphur, limerock, etc. Then the operating costs of each department already figured for distribution will be posted to the production reports and entries made for fixed charges. These reports will also be most useful if drawn up in comparative form as in the case of the reports of operations. Columns for "per ton" costs as well as total costs should be included, as should also figures for quantities of opening and closing inventories, production and consumption or shipment. Again space should be provided for "Remarks." To illustrate more clearly,—the sulphite production report might well be lined up as follows:

SULPHITE PULP PRODUCTION

THIS YEAR

	Current Month		*Year to Date*	
	Amount	*Per Ton*	*Amount*	*Per Ton*
Manufacturing Costs:				
Pulp wood				
Sulphur				
Limerock				
Materials				
Wood room				
Wet room				
Acid plant and digesters	(Similar columns for "Last Year" on fold over section of sheet)			
Steam department				
Electric department				
General operating exp.				
Insurance				
Taxes				
Depreciation				
Conversion costs				
Cost of pulp made				
Deduct stock to inventory				
Add stock from inventory				
Cost of pulp used				
Tons on hand first of month				
Production				
Consumption				
Tons on hand end of month				
Cords of wood used				
Yield per cord—pounds				
Price per cord				
Sulphur used per ton—pounds				
Limerock used per ton—pounds				
Number of cooks				
Average time per cook				

Remarks:

The cost of newspaper shipped is a distinct figure on the newspaper production report and is picked up directly on the profit and loss statement. If an analysis of inventory by classifications is included with the regular financial statements as a subsidiary schedule to the balance sheet, inventory changes and the reasons therefore will be easily traceable through this suggested set of reports.

One further cost report is desirable for the completed set, particularly where pulp in slush form is delivered to the paper mill and not stored, lapped, or sold, and that is a report of total newsprint manufacturing costs. This report should assemble without departmentalization all cost figures grouped into individual accounts under direct materials, conversion materials, conversion labor, fixed charges, and pulp inventory changes. Executives will be interested in comparisons of unit distributed costs, but their interest will always be more easily focused on total direct expenditures for the few important basic elements of cost which appear only on the statement here outlined. Particularly in times of abnormal and probably partial operation, unit costs may not furnish reliable means of cost control which can better be obtained from total figures only. This is true where cash position must be watched with care and where payroll changes are contemplated. These figures will also furnish a convenient basis of comparison with estimates of manufacturing costs and of cash expenditures for the period.

Frequency of Reports:

The problem of how frequently the accounting department should prepare and submit reports depends somewhat upon the personality of the executive. In other words the general manager and other officers should get reports just as often as they want them and will use them. With this proviso the following intervals are suggested for different types of reports:

Daily ..... Reports of quantity production:
- Groundwood
- Sulphite
- Paper

Tests of moisture in paper made
Report of shipments
Report of weather and water conditions

Weekly ..... Labor reports
Paper machine production and efficiency records
Progress of construction work

Monthly ..... Financial Statements:
Balance sheet (with some supporting detail, but probably of inventories only)
Profit and loss statement
Production reports by major producing departments; and operating statements by all departments
Report of Total manufacturing costs
Steam plant efficiency report
Report of machine clothing and wires
Budget comparisons

Use of Cost Reports:

To be worth while, cost reports must be designed for the use of executives to assist them in control of profits. They are not to be used by cost accountants and they are not an end in themselves. The fundamental difference in point of view between the typical office man and the usual type of operating executive must be borne in mind in preparing reports.

The form in which the report is presented will have a good deal to do with whether or not it is used. Reports on large sheets of paper are to be avoided. They are cumbrous to handle and important figures or items cannot be made to stand out. Ordinary letter size sheets are probably the largest that should be used or double sheets folding to this size. The set-up of reports should be standardized, which can best be done by use of printed forms. Attention to size of type and spacing and ruling and set-up is important. Figures should never be crowded, and additional space should always set out important totals or other items. A few dollars spent in the careful designing and printing of current report forms is often worth more than the entire payroll cost of one or two clerks in the office. If an executive is to use reports he will need them in or near his desk. Suitable binders should therefore be provided—probably ring binders—of good appearance and not too large to be easily kept in a desk drawer.

The importance of items other than the mere dollars and cents which add and prove up the statements has already been mentioned. The general manager will constantly be watching for significant information to help him in controlling operations. This is where the "Remarks" spaces assume their importance. Such spaces should be provided on the balance sheets and profit and loss statements as well as on the cost reports. The manager wants to know and the cost accountant should inform him in conjunction with his cost figures of such significant factors as: ratio of wood to ton of paper, percentage of sulphite content in newsprint (the lower the percentage of sulphite consistent with quality the cheaper the cost, since sulphite costs much more than groundwood); yield of sulphite per cord of wood; yield of groundwood per cord; steam cost per ton of production; coal cost per M pounds of steam; output of grinders per pulp stone per twenty-four hours; cost of machine clothing and wires and of lubricants per ton of production, and other data referred to previously. The treasurer wants to know the total cash expended for payrolls, —for repairs, etc.; profits before and after depreciation; fixed charges per share; profits per share of stock and per ton of shipments. Not all of the above are equally important of course. But most of these factors will be needed and wanted by the general manager or treasurer, who will have them figured in his own office or reported separately from various departments if the cost accountant does not measure up to his responsibilities and opportunities and see that all essential figure information is correctly and concisely reported from his own office.

Most of the above comments apply to conditions that have prevailed for years. Due to highly competitive conditions in the industry as well as to improvement in financial technique in general business most newsprint mills as well as other factories now budget their manufacturing expense programs with great care. The cost accountant should prepare this budget in accordance with the instructions from the management. It is not within the province of this article to discuss budgeting, otherwise than by reference to it as a necessary part of the financial machinery of any large business that is to succeed today. In relationship to cost reports the use of budgets makes necessary a comparison of

actual cost results with estimates. This comparison should be just as simple as possible. More important than a listing of actual and estimated figures will be a statement of explanations; that the final result differed from the estimate by so much due to the following listed variances (listing only the important variances). A brief explanation should be noted against each variance.

Budgets are of two kinds: (1) the budget of operating figures, (2) the budget of cash receipts and expenditures. The cost accountant has the major responsibility for explaining variances from the first budget. He should also report explanations of variances from expected balance sheet position in regard to inventories of manufactured product, and of supplies or raw materials if these have not been purchased or used in the quantities expected. This second series of comparisons will give the general accountant much of the information he will need to prepare comparisons of actual and expected cash position at any given date.

Relation of Cost Statements to Financial Statements:

The purpose of the cost statement has been emphasized throughout this article, namely, to provide executives with proper cost information to enable them to control earnings and financial position. The form and content of the statements have been planned to serve this purpose. To that end every statement leads toward the two major financial statements, the balance sheet and the profit and loss statement. The whole set of statements should tie in so that the general manager, when he wishes more information relative to an item on one of the principal statements, can trace figures back from statement to supporting statement.

For instance, the manager notes from the profit and loss statement that the company made less profit than he expected in a given month. He knows what the production was, and he knows from the budget for the given production that profit per ton should have been a certain figure larger than the actual. He follows the cost of paper sold back to the paper department production report, and finds the per ton cost higher than normal. Further comparison shows that sulphite and groundwood also cost more than the estimate. A common item that is large proves to be

steam cost. By tracing back yet further from the production sheets to the departmental operating sheets it is found that the quantity of coal used was excessive, due perhaps to low water conditions, a poor run of coal, conditions in the boiler room or some other unusual cause. The manager is now prepared to solve this difficulty, because he has located it. Consultation with the steam engineer follows at once.

The above is a hypothetical tracing of figures. Other larger than normal items can be traced similarly, and it is of course true that for such an important item as coal consumption the reports of efficiency (or lack of it) from the steam department should have brought excessive expenses to the management's attention directly. It is frequently the case, however, that an actual effect on profits must be shown in figures to bring home the real effect of variations above normal expenditure.

Most general managers today are quite dependent on information supplied by their accounting departments, and have a sufficient knowledge of the elements of accounting to read financial reports and cost statements intelligently. The cost accountant misses his greatest opportunity for usefulness, however, if he merely places his reports on the desk of the general manager. He should endeavor whenever possible to go over them personally with the executive. He can trace figures and guide the eye of the manager from principal statement to supporting figure, rather than let the manager do his own searching as outlined a few paragraphs above. Having assembled the figures he should know at once the important items to call to the executive's attention.

Furthermore, if it is customary to go over the statements in personal consultation as above suggested, he will be at hand to answer at once a number of questions that will be likely to occur to the manager in his perusal of the statements. In a time of serious business depression and persistently falling markets questions such as the following will be in every manager's mind:

How much of the manufacturing cost of paper per ton is represented by depreciation—by taxes?

How much will our paper (or pulp) costs decrease per ton if the price of wood is reduced so much per cord?

What will be the manufacturing cost of newspaper per ton for production of x,000 tons? Of y,000 tons?

What production at current prices will be required to earn dividends?

How much can we save if the percentage of sulphite content in news print can be reduced from X% to Y%?

How much can we probably save if we can keep the moisture content in our paper at a constant ratio of say W per cent?

What will be the effect on costs per ton of a cut in wages of Z%? Of a reduction in salaries of A% or of $B? What will be the effect of such changes on the company's cash position?

How much cash can we reasonably expect as a balance on (blank date)?

How much will our cash position at (blank date) be strengthened by a different method of purchasing wood—or coal—or sulphur?

If the general manager and the accountant jointly discuss such questions, the manager has used his accounting department to its greatest efficiency as a help in controlling operations and hence profits, and the accountant has lived up to his opportunities to make the expense of his department truly productive instead of a mere overhead charge.

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STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912,

Of N. A. C. A. Bulletin, published semi-monthly at New York, N. Y. for Oct. 1, 1932.
State of New York, County of New York, ss.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared S. C. McLeod, who, having been duly sworn according to law, deposes and says that he is the Business Manager of the N. A. C. A. Bulletin and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, National Association of Cost Accountants, 1790 Broadway, New York, N. Y. Editor, T. M. Dickerson, 1790 Broadway, New York, N. Y. Managing Editor, none. Business Manager, S. C. McLeod, 1790 Broadway, New York, N. Y.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) National Association of Cost Accountants, 1790 Broadway, New York, N. Y. President, H. A. Bullis, General Mills, Inc., Minneapolis, Minn. Secretary, S. C. McLeod, 1790 Broadway, New York, N. Y. Treasurer, Wm. O. Cutter, 1790 Broadway, New York, N. Y.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the six months preceding the date shown above is..... (This information is required from daily publications only.)

S. C. McLEOD,
Business Manager.

Sworn to and subscribed before me this 3rd day of Oct., 1932.
(SEAL)
W. P. SADTLER, Jr.,
Notary Public.
New York County Clerk's No. 682.
New York County Register's No. 4-S-623.
Commission expires March 30, 1934.